NABL

National Accreditation Board for Testing and Calibration Laboratories

(An Autonomous Body under Department of Science & Technology, Govt. of India)

CERTIFICATE OF ACCREDITATION

HI-TECH CALIBRATION SERVICES

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

No.209, VGP Nagar, Muggapair West, Chennai, Tamil Nadu

in the discipline of

ELECTRO-TECHNICAL CALIBRATION

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Certificate Number C-1262

Issue Date 07/11/2016

Valid Until 10/09/2017

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

Avijit Das	Anil Relia	Prof. S. K. Joshi
Program Manager	Director	Chairman

NABL
SCOPE OF ACCREDITATION

Laboratory	**Hi Tech Calibration Services, No. 209, 2nd Floor, VGP Nagar, Mugappair West, Chennai, Tamil Nadu**		
Accreditation Standard	**ISO/IEC 17025:2005**		
Discipline	**Electro-Technical Calibration**	**Issue Date**	**07.11.2016**
Certificate Number	**C-1262**	**Valid Until**	**10.09.2017**
Last Amended on	**-**	**Page**	**1 of 6**

	Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
	SOURCE			
1.	**DC VOLTAGE#**	0.1 mV to 329 mV	1.2 % to 0.003 %	Using Multiproduct Calibrator Fluke 5522A by Direct Method
		329 mV to 1000 V	0.003 % to 0.002 %	
2.	**AC VOLTAGE#**	**45 Hz to 1 kHz**		
		3 mV to 30 mV	0.3 % to 0.043 %	Using Multiproduct Calibrator Fluke 5522A by Direct Method
		30 mV to 300 mV	0.043 % to 0.02 %	
		300 mV to 300 V	0.02 % to 0.023 %	
		300 V to 1000 V	0.023 % to 0.04 %	
3.	**DC CURRENT#**	100 µA to 329 µA	0.040 % to 0.026 %	Using Multiproduct Calibrator Fluke 5522A by Direct Method
		329 µA to 3.29 mA	0.026 % to 0.014 %	
		3.29 mA to 329 mA	0.014 % to 0.013 %	
		329 mA to 2.99 A	0.013 % to 0.046 %	
		2.99 A to 20 A	0.046 % to 0.12 %	
		20 A to 100 A	2.1 % to 1.7 %	Using Multiproduct Calibrator with Current Coil Fluke 5522A & 5500A by Direct Method
		100 A to 1000 A	1.7 %	
4.	**AC CURRENT#**	**45 Hz to 1 kHz**		
		33 µA to 329 µA	0.6 % to 0.2 %	Using Multiproduct Calibrator Fluke 5522A by Direct Method
		329 µA to 3.29 mA	0.2 % to 0.12 %	
		3.29 mA to 32.9 mA	0.12 % to 0.06 %	
		32.9 mA to 329 mA	0.06 %	
		329 mA to 2.99 A	0.06 % to 0.08 %	
		2.99 A to 20 A	0.08 % to 0.2 %	
		50 Hz		
		20 A to 100 A	3.1 % to 2.5 %	Using Multiproduct Calibrator with Current Coil Fluke 5522A & 5500A by Direct Method
		100 A to 1000 A	2.5 %	

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Last Amended on	**-**	**Page**	**2 of 6**

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5.	**DC RESISTANCE#**	2 Ω to 30 Ω	0.6 % to 0.07 %	Using Multiproduct Calibrator Fluke 5522A by Direct Method
		30 Ω to 300 Ω	0.07 % to 0.011 %	
		300 Ω to 3 kΩ	0.011 %	
		3 kΩ to 300 kΩ	0.011 % to 0.008 %	
		300 kΩ to 3 MΩ	0.008 % to 0.02 %	
		3 MΩ to 30 MΩ	0.02 % to 0.04 %	
		30 MΩ to 290 MΩ	0.04 % to 0.4 %	
		290 MΩ to 1.09 GΩ	0.4 % to 2 %	
6.	**DC RESISTANCE#**	0.01 Ω to 0.1 Ω	3.89 % to 0.62 %	Using Decade Resistance Box & Decade Meg Ohm Box by Direct Method
		0.1 Ω to 1 Ω	0.62 % to 0.07 %	
		1 Ω to 10 Ω	0.07 % to 0.06 %	
		10 Ω to 100 kΩ	0.06 %	
		100 kΩ to 100 MΩ	0.06 % to 2.44 %	
		100 MΩ to 100 GΩ	2.44 % to 6.0 %	
7.	**FREQUENCY#**	1 Hz to 1000 Hz	0.0011 % to 0.00051 %	Using Multiproduct Calibrator Fluke 5522A by Direct Method
		1000 Hz to 100 kHz	0.00051 % to 0.00065 %	
8.	**CAPACITANCE #**	**1 kHz**		Using Multiproduct Calibrator Fluke 5522A by Direct Method
		0.35 nF to 0.6 nF	4.1 % to 2.6 %	
		0.6 nF to 1 nF	2.6 % to 1.8 %	
		100 Hz		
		1 nF to 7 nF	1.8 % to 0.5 %	
		7 nF to 300 nF	0.5 % to 0.4 %	
		50 Hz		
		300 nF to 30 µF	0.4 % to 0.6 %	
		30 µF to 33 mF	0.6 % to 1.7 %	
9.	**DC POWER#**	1 V to 1000 V 1 A to 20 A 1 W to 20 kW	0.11 % to 0.14 %	Using Multiproduct Calibrator Fluke 5522A by Direct Method

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Last Amended on	**-**	**Page**	**3 of 6**

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10.	**AC POWER 1Ø#**	50 Hz @ UPF 60 V to 240 V 10 mA to 20 A 0.6 W to 4.8 kW 50 Hz @ 0.2 pF 60 V to 240 V 10 mA to 20 A 0.12 W to 0.96 kW	3.00 % to 0.07 %	Using Multiproduct Calibrator Fluke 5522A by Direct Method
11.	**POWER FACTOR 1Ø#**	± 0.2 to UPF (Lead / Lag)	0.0021 to 0.0013	Using Multiproduct Calibrator Fluke 5522A by Direct Method
12.	**OSCILLOSCOPE# AMPLITUDE (Vertical axis Deflection Factor)**	DC: 1.25 mV to 130 V @ 1 MΩ 1 kHz Square Wave @ 1 MΩ 10 mV to 130 V	0.75 % to 0.07 % 0.25 % to 0.15 %	Using Multiproduct Calibrator Fluke 5522A & SC600 by Direct Method
	TIME BASE (Horizontal Axis Deflection Factor)	2 ns to 2 s	0.007 % to 0.2 %	
	BANDWIDTH	Up to 500 MHz	5 %	

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Last Amended on	-	Page	4 of 6

Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
13. TEMPERATURE SIMULALTION#			
RTD Pt 100	(-) 200 °C to 600 °C	0.027 °C	Using Multiproduct Calibrator Fluke 5522A by Direct Method
	600 °C to 800 °C	0.18 °C	
K Type Thermocouples	-200 °C to 1370 °C	0.23 °C	
J Type Thermocouples	-200 °C to 1150 °C	0.16 °C	
E Type Thermocouples	-200 °C to 950 °C	0.15 °C	
B Type Thermocouples	600 °C to 1820 °C	0.61 °C	
S Type Thermocouples	50 °C to 1760 °C	0.55 °C	
R Type Thermocouples	50 °C to 1760 °C	0.59 °C	
N Type Thermocouples	-100 °C to 1250 °C	0.18 °C	
T Type Thermocouples	-250 °C to 350 °C	0.5 °C	
MEASURE			
1. **DC VOLTAGE#**	0.1 mV to 100 mV	5 % to 0.01 %	Using 6 ½ Digit Multimeter by Direct Method
	100 mV to 1 V	0.01 % to 0.0054 %	
	1 V to 1000 V	0.0054 %	
2. **AC VOLTAGE#**	**50 Hz to 1 kHz** 0.1 V to 750 V	0.11 %	Using 6 ½ Digit Multimeter by Direct Method
3. **DC CURRENT#**	10 µA to 100 µA	0.35 % to 0.09 %	Using 6 ½ Digit Multimeter by Direct Method
	100 µA to 100 mA	0.09 % to 0.063 %	
	100 mA to 3 A	0.063 % to 0.2 %	
	3 A to 30 A	0.36 %	Using 6 ½ Digit Multimeter & Shunt by Direct Method

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Last Amended on	**-**	**Page**	**5 of 6**

	Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
4.	**AC CURRENT#**	**50 Hz to 1 kHz**		
		100 µA to 3 A	0.17 %	Using 6 ½ Digit Multimeter by Direct Method
		3 A to 30 A	0.46 %	Using 6 ½ Digit Multimeter & Shunt by Direct Method
5.	**DC RESISTANCE#**	0.1 Ω to 10 Ω	0.46 % to 0.06 %	Using 6 ½ Digit Multimeter by Direct Method
		10 Ω to 100 Ω	0.06 % to 0.02 %	
		100 Ω to 1 MΩ	0.02 % to 0.02 %	
		1 MΩ to 10 MΩ	0.02 % to 0.05 %	
		10 MΩ to 100 MΩ	0.05 % to 0.93 %	
		100 MΩ to 1 GΩ	0.93 % to 9.24 %	
6.	**FREQUENCY#**	3 Hz to 10 Hz	0.08 % to 0.05 %	Using 6 ½ Digit Multimeter by Direct Method
		10 Hz to 100 Hz	0.05 % to 0.01 %	
		100 Hz to 300 kHz	0.01 %	
7.	**TIME#** (Timer / Stop Watch)	1 s to 1000 s	0.002 s to 0.063 s	Using Time Totaliser by Direct Method
		1000 s to 5000 s	0.063 s to 0.25 s	
		5000 s to 86400 s	0.25 s to 1 s	
8.	**TEMPERATURE SIMULATION#**			
	RTD Pt 100	(-) 200 °C to 800 °C	0.20 °C	Using 6 ½ Digit Multimeter by Direct Method
	K Type Thermocouples	(-)200 °C to 1370 °C	0.21 °C	Using Multiproduct Calibrator Fluke 5522A by Direct Method
	J Type Thermocouples	(-)200 °C to 1200 °C	0.14 °C	
	E Type Thermocouples	(-)200 °C to 1000 °C	0.12 °C	
	B Type Thermocouples	600 °C to 1820 °C	0.6 °C	
	S Type Thermocouples	50 °C to 1768 °C	0.58 °C	
	R Type Thermocouples	50 °C to 1768 °C	0.59 °C	
	N Type Thermocouples	(-)270 °C to 1300 °C	0.17 °C	
	T Type Thermocouples	(-)100 °C to 400 °C	0.11 °C	

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Last Amended on	-	Page	6 of 6

	Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
9.	DC HIGH VOLTAGE#	1 kV to 5 kV 5 kV to 30 kV	1.5 % 1.5 %	Using High Voltage Probe with DMM Fluke 80K - 40 / 80K - 6 & 87V by Direct Method
10.	AC HIGH VOLTAGE#	**50 Hz** 1 kV to 5 kV 5 kV to 28 kV	 2.5 % 2.5 % to 6.2 %	Using High Voltage Probe with DMM Fluke 80K - 40 / 80K - 6 & 87V by Direct Method

*** Measurement Capability is expressed as an uncertainty (±) at a confidence probability of 95%**
 # The laboratory is also capable for site calibration however, the uncertainty at site depends on the prevailing actual environmental conditions and master equipment used.

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